

REMARKS

This Amendment is submitted in response to the Office Action dated February 28, 2003. In the Office Action, the Patent Office alleged that the title of the invention is not descriptive. Further, the Patent Office objected to Claim 19 alleging that the claim has an informality. The Patent Office rejected Claims 1-16 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. In addition, the Patent Office rejected Claims 1, 10, 17 and 18 under 35 U.S.C. §102(b) as being anticipated by *Mori et al.* (U.S. Patent No. 4,661,695) and rejected Claims 11, 12 and 14 under 35 U.S.C. §102(b) as being anticipated by *Lowi, Jr.* (U.S. Patent No. 5,799,629). Further, the Patent Office rejected Claims 5 and 19 under 35 U.S.C. §103(a) as being unpatentable over *Mori et al.*; rejected Claims 2 and 3 under 35 U.S.C. §103(a) as being unpatentable over *Mori et al.* in view of *Smietana*; (U.S. Patent No. 5,231,959); rejected Claim 13 under 35 U.S.C. §103(a) as being unpatentable over *Lowi, Jr.* in view of *Smietana*; rejected Claims 14 and 15 under 35 U.S.C. §103(a) as being unpatentable over *Lowi, Jr.* in view of *Mori et al.*; rejected Claims 4, 6, 8, 9 and 20-22 under 35 U.S.C. §103(a) as being unpatentable over *Mori et al.* in view of *Lowi, Jr.*; and rejected Claim 7 under 35 U.S.C. §103(a) as being unpatentable over *Mori et al.* in view of *Lowi, Jr.* and further in

view of *Brunet et al.* (U.S. Patent No. 6,170,573).

By the present Amendment, Applicant amended the title of the invention to provide a title indicative of the invention to which the claims are directed. Applicant amended the specification to describe an interior surface within a machine element. In addition, Applicant amended Claims 1, 3, 5, 6, 8-11, 14, 17, 19, 20 and 22. Applicant asserts that the amendments to the title, specification and claims overcome the objection and rejections made by the Patent Office and place the application in condition for allowance. Notice to that effect is requested.

In the Office Action, the Patent Office alleged that the title of the invention is not descriptive. The Patent Office requires a new title indicative of the invention to which the claims are directed. In response, Applicant amended the title of the invention to "An Apparatus, A System and a Method for Monitoring a Position of a Shaft Element in a Cylinder and an Apparatus, a System and a Method for Cleaning of the Shaft Element" to which Claims 1-22 are directed. Specifically, independent Claims 1 and 17, as amended, are directed to an apparatus and method, respectively, for measuring displacement of a machine element. The displacement is based on monitoring of a position of the machine element, as described in amended Claims 1 and 17. Independent Claim 11, as amended, is directed to an apparatus for cleaning a machine component. Thus, Applicant asserts that the title, as

amended, is indicative of the invention to which the claims are directed. Therefore, the objection of the Patent Office with respect to the title has been overcome. Approval of the new title is requested.

The Patent Office objected to Claim 19 alleging that the claim has an informality. Namely, the Patent Office alleged that the phrase "said output signal" lacked proper antecedent basis. In response to the objection, Claim 19 was amended to depend from Claim 18, thus providing antecedent basis for the phrase "said output signal." Accordingly, Applicant submits that the objection with respect to Claim 19 has been overcome. Notice to that effect is requested.

The Patent Office rejected Claims 1-16 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. In response, Applicant amended independent Claim 1 to define a machine element having a body defining an interior wherein the wall has an interior surface and a length defined between a first end and a second end. The machine element has a first wall at the first end and a second wall at the second end substantially enclosing the interior. Independent Claim 11, as amended, defines a machine element having a body defining an interior wherein the body has an interior surface and a length defined between a first end and a second end. Applicant asserts

that Claims 1 and 11 clearly define the structure of the machine element and, therefore, distinctly claim the subject matter which Applicant regards as the invention. Accordingly, Applicant asserts that the rejection by the Patent Office has been overcome and should be withdrawn. Notice to that effect is requested.

In the Office Action, the Patent Office rejected Claims 1, 10, 17 and 18 under 35 U.S.C. §102(b) as being anticipated by *Mori et al.* (U.S. Patent No. 4,661,695). The Patent Office alleged that:

Mori et al. disclose (see Figure 1) an apparatus for measuring displacement, comprising: a machine element (2) having an interior wall, an exterior wall and a first end wall (between V1 and V2) enclosing the interior wall; a shaft element (attached to 3) within the machine element; a head element (3) attached to the shaft element adjacent to the interior wall; a light source (within 4; 44 of Figure 2) attached to the machine element; and a sensor (45 of Figure 2) attached to the machine element and positioned to detect intensity of light within the machine element. *Mori et al.* further disclose (see Figure 2) an additional sensor (other instance of 45) attached to the machine element and positioned to detect intensity of light within the machine element.

Regarding Claims 17 and 18, the Patent Office alleged that:

Mori et al. disclose (see Figure 1) a method of measuring displacement of a machine element, comprising: providing a machine element (2) having an interior, an exterior wall and an end wall (between V1 and V2); providing a shaft element (attached to 3) capable of movement within the machine element; attaching a head element (3) to the shaft element; positioning the head element adjacent to the interior wall; attaching a light source and sensor (44, 45; see Figure 2) to the machine element; and measuring intensity of light within the machine element from reflected light detected by the sensor. *Mori et al.* further disclose (see Figures 4-7) moving the shaft element and producing an output signal as the shaft element moved within the machine element.

However, independent Claim 1, as amended, defines an apparatus for measuring displacement having a machine element. A sensor is attached to the machine element and positioned to detect intensity of light within the machine element wherein the intensity of light corresponds to a position of a head element within the machine element at any point between a first end and a second end of the machine element.

The apparatus disclosed in *Mori et al.* merely detects a position of a piston when the piston reaches a top dead center position in an engine. However, independent Claim 1, as amended, requires an apparatus which measures an intensity of light wherein the intensity corresponds to a position of a head element within a machine element at any point between a first end and a second end of the machine element.

Independent Claim 17 defines a method for measuring displacement of a machine element. A shaft element is provided and is capable of movement within the machine element. The method has the step of attaching a head element to the shaft element. The method also has the steps of attaching a light source to the machine element on a first side of the head element; and attaching a sensor to the machine element on a second side of the head element wherein the first side and the second side are not the same.

However, in *Mori et al.*, the light source and the sensor are

on the same side of the head element. Thus, *Mori et al.* do not disclose the elements of independent Claim 17.

In the Office Action, the Patent Office rejected Claims 11, 12 and 14 under 35 U.S.C. §102(b) as being anticipated by *Lowi, Jr.* (U.S. Patent No. 5,799,629). The Patent Office alleged that:

Lowi, Jr. discloses (see Figures 1 and 6) an apparatus for cleaning a machine component, comprising: a machine element (cylinder) having an interior wall, an exterior wall and an end wall enclosing the interior wall; a shaft element (piston shaft; 75 of Figure 6) movable within the machine element; and a head element (piston) attached to the shaft element and adjacent to the interior wall of the machine element; and a first brush and second brush (77) positioned at the end wall of the machine element in contact with the shaft element. *Lowi, Jr.* further discloses (see Figure 1) a seal (30) disposed around the shaft.

However, independent Claim 11, as amended, defines an apparatus for cleaning a machine component. The apparatus has a machine element having a body defining an interior wherein the body has an interior surface and a length defined between a first end and a second end. The apparatus also has a shaft element movable within the machine element. A first brush is positioned exterior to the body of the machine element in contact with a portion of the shaft element which extends from the body of the machine element.

Independent Claim 11, as amended, defines a brush positioned exterior to a body of a machine element. This feature is not disclosed in *Lowi, Jr.* Specifically, in *Lowi, Jr.*, the brush is contained within the body of the machine element.

Under 35 U.S.C. §102, anticipation requires that a single reference discloses each and every element of Applicant's claimed invention. *Akzo N.V. v. U.S. International Trade Commission*, 808 F.2d 1471, 1479, 1 USPQ 2d. 1241, 1245 (Fed. Cir. 1986). Moreover, anticipation is not shown even if the differences between the claims and the reference are "insubstantial" and one skilled in the art could supply the missing elements. *Structure Rubber Products Co. v. Park Rubber Co.*, 749 F.2d. 707, 716, 223 USPQ 1264, 1270 (Fed. Cir. 1984).

Since both *Mori et al.* and *Lowi, Jr.* fail to disclose the elements defined in amended Claims 1, 11 and 17, the rejections under 35 U.S.C. §102(b) with respect to these claims have been overcome and should be withdrawn. Notice to that effect is requested.

In the Office Action, the Patent Office rejected Claims 5 and 19 under 35 U.S.C. §103(a) as being unpatentable over *Mori et al.*; rejected Claims 2 and 3 under 35 U.S.C. §103(a) as being unpatentable over *Mori et al.* in view of *Smietana* (U.S. Patent No. 5,231,959); rejected Claim 13 under 35 U.S.C. §103(a) as being unpatentable over *Lowi, Jr.* in view of *Smietana*; rejected Claims 14 and 15 under 35 U.S.C. §103(a) as being unpatentable over *Lowi, Jr.* in view of *Mori et al.*; rejected Claims 4, 6, 8, 9 and 20-22 under 35 U.S.C. §103(a) as being unpatentable over *Mori et al.* in view of *Lowi, Jr.*; and rejected Claim 7 under 35 U.S.C. §103(a) as being

unpatentable over *Mori et al.* in view of *Lowi, Jr.* and further in view of *Brunet et al.* (U.S. Patent No. 6,170,573).

Smietana, the Patent Office alleges, teaches a coating on a shaft element and interior wall of a similar device (see column 3, lines 15-20). *Smietana* allegedly recognizes that such coatings prevent galling.

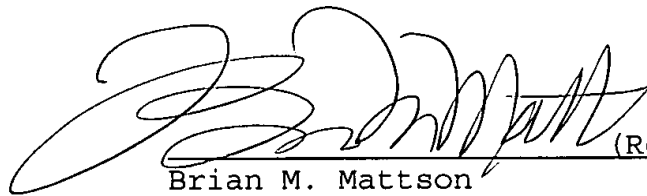
Brunet et al., the Patent Office alleges, teach a wire brush for cleaning a machine element (see column 10, lines 45-60). *Brunet et al.* allegedly recognize that wire brushes are effective in cleaning machine elements.

However, none of the above-mentioned references, either singly or in combination, teach the elements of independent Claims 1, 11 and 17, as amended. Claims 2-10 depend from Claim 1; Claims 12-16 depend from Claim 11; and Claims 18-22 depend from Claim 17. These dependent claims set forth additional structural elements and novel steps of Applicant's apparatus, system and method for position monitoring and/or cleaning of a machine element. Therefore, these dependent claims are believed allowable over the references of record for the same reasons set forth with respect to their parent claims.

In view of the foregoing remarks, Applicant respectfully submits that all of the claims in the application are in allowable form and that the application is now in condition for allowance. If any outstanding issues remain, Applicant urges the Patent Office

to telephone Applicant's attorney so that the same may be resolved and the application expedited to issue. Applicant requests the Patent Office to indicate all claims as allowable and to pass the application to issue.

Respectfully submitted,

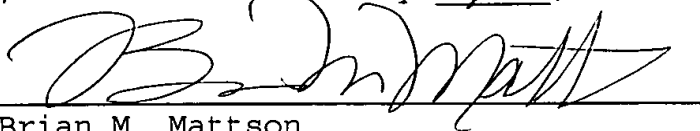


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CERTIFICATE OF MAILING

I hereby certify that this **Amendment** is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to Mail Stop Non-Fee Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on May 7, 2003.



Brian M. Mattson